

Rapid Biosynthesis of Silver-Montmorillonite Nanocomposite Using Water Extract of *Satureja hortensis* L. and Evaluation of the Antibacterial Capacities

Authors : Sajjad Sedaghat

Abstract : In this work, facile and green biosynthesis and characterization of silver-montmorillonite (MMT) nanocomposite is reported at room temperature. Silver nanoparticles (Ag-NPs) were synthesized into the interlamellar space of (MMT) by using water extract of *Satureja hortensis* L as reducing agent. The MMT was suspended in the aqueous AgNO₃ solution, and after the absorption of silver ions, Ag⁺ was reduced using water extract of *Satureja hortensis* L to Ag⁰. Evaluation of the antibacterial properties are also reported. The nanocomposite was characterized by ultraviolet-visible spectroscopy (UV-Vis), powder X-ray diffraction (XRD), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). TEM study showed the formation of nanocomposite using water extract of *Satureja hortensis* L in the 4.88 - 26.70 nm range and average particles size were 15.79 nm also the XRD study showed that the particles have a face-centered cubic (fcc) structure. The nanocomposite showed the antibacterial properties against Gram-positive and Gram-negative bacteria.

Keywords : antibacterial effects, montmorillonite, *Satureja hortensis* l, transmission electron microscopy, nanocomposite

Conference Title : ICNN 2018 : International Conference on Nanochemistry and Nanoengineering

Conference Location : Paris, France

Conference Dates : September 20-21, 2018